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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,568

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Haruyuki Sato

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EXAMINER

CORDRAY, DENNIS R

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

08/12/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/521,568	Applicant(s) SATO, HARUYUKI	
	Examiner DENNIS CORDRAY	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,7,11,13,14,16,17,19,20,22-24 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7,11,13,14,16,17,19,20,22-24 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/9/2008 has been entered.

It is noted that Claims 1, 2, 14 and 28 are incorrectly submitted. Since the previously submitted after-final amendment on 5/5/2008 was not entered, the referenced claims should carry the same status identifier and formatting as those submitted on 5/5/2008. However, in the interest of expediting prosecution, the currently submitted claims are entered and acted upon herein.

Claim Objections

Claims 28 and 29 are objected to because of the following informalities: the claims contain several instances of the word (meta)acrylate or (meta)acrylamide. The words should be changed to (meth)acrylate or (meth)acrylamide. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "the water-soluble polymer (C)" in Claim 1. There is insufficient antecedent basis for this limitation in the claim.

Response to Arguments

Applicant's arguments and amendments, filed 6/9/2008, with respect to the rejection of Claims 1-2, 6-7, 11-14, 16-20, 22-24 and 26-27 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The rejection has been withdrawn. Also, all rejections of Claims 12, 18 and 25-27 have been withdrawn since the claims are cancelled.

Applicant's amendments have overcome the rejection of Claims under 35 U.S.C. 103(a) over Zhang et al in view of others as written. The rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made as detailed below.

The arguments regarding Zhang et al are moot as the reference is not used in the outstanding rejection. However, the following comments are offered in response to Applicant's other arguments.

Fallon was used merely to teach that adding retention aids to the wet end of a papermaking process is widely practiced and is very important to the papermaking process. A widely practiced step is considered by the Examiner to have been generally known and obvious to those of ordinary skill in the art.

Regarding Claim 13, the Examiner has shown via a general textbook type reference that the claimed papermaking speed is typical for most paper types. Again, the claimed speed is considered by the Examiner to have been generally known and obvious to those of ordinary skill in the art. Absent convincing evidence of unexpected results, why would it not have been obvious to make paper at the typical speeds?

The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The claimed paper quality improving effects are discussed in the rejection herein.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2, 6-7, 11, 13-14, 16-17, 19-20, 22-24, 29 and 30 are rejected under 35 U.S.C.103(a) as unpatentable over Connors et al (6020422) in view of Linhart et al

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(6303002) and Fallon (5571380) and as evidenced by Xiao et al (5747392) and Smook (Handbook for Pulp and Paper Technologists).

Claims 1-2, 16-17, 23-24, 29 and 30: Connors et al discloses a method of making paper comprising adding water soluble copolymers to an aqueous papermaking furnish containing pulp to drain water from the paper while aiding the retention of fines in the paper product. The copolymers are also useful to control stickies and pitch in papermaking (Abs; col 3, lines 13-24; col 9, lines 21-25 and 54-59). In some embodiments, the copolymers, provided in an aqueous dispersion, comprise:

- (i) from about 0 to 60 mole-% hydrophobic monomers such as N-alkyl (meth)acrylamides, alkyl (meth)acrylates, alkylstyrenes having 1-16 carbon atoms in the alkyl group and alkyl esters derived from the reaction of alkanols having 1-16 carbon atoms with maleic anhydride or fumaric acid (correspond to the claimed nonionic monomers having a solubility parameter of 20.5 or less);
- (ii) from about 20 to 95 mol-% acrylamide and methacrylamide (correspond to the claimed nonionic monomers having a solubility parameter of 26.6 or more); and
- (iii) from about 5 to 80 mol-% cationic monomers such as (meth)acryloxyethyltrimethyl ammonium chloride, (meth)acryloxyethyldimethylbenzyl ammonium chloride and (meth)acrylamidopropyltrimethyl ammonium chloride.

The copolymers have a molecular weight from about 5,000 to 20,000,000 (col 6, line 40 to col 7, line 55; col 8, lines 41-48 and 63-65). The composition of the disclosed copolymers significantly overlays that of the claimed copolymer (A). As a retention aid

in a papermaking furnish, the copolymers are added in an amount of 1 lb/ton, or 0.05% by weight (col 18, line 62 to col 19, line 24).

Connors et al does not explicitly disclose forming a paper layer while water in a dilute solution of pulp material is filtered through a wire while moving thereon. Connors et al further does not disclose the claimed surfactant (B) and forming a mixture of cationic copolymer and surfactant by adding the surfactant to an aqueous solution of the copolymer. Connors et al also does not disclose the paper quality improving effect.

Fallon teaches a typical papermaking process comprising forming a fiber mat on a moving wire from a dilute aqueous slurry and dewatering the slurry (filtering). Adding retention aids to the wet end is widely practiced and very important to the process (col 1, lines 14-42).

Linhart et al discloses a method of controlling tacky impurities such as stickies in papermaking comprising adding from 0.005 to 0.5% by weight of dry paper stock of nonionic surfactants, corresponding to surfactant (B), and from 0.01 to 1% by weight of dry paper stock of cationic polymers (fixing agents) having a charge density of at least 1.5 meq/g, corresponding to copolymer (A), to a papermaking stock and draining the stock to make paper. The ratio of cationic polymer to surfactant significantly overlays the claimed range. The surfactant and cationic polymer serve to fix tacky impurities in the papermaking stock in the paper produced. Cationic polyacrylamides comprising acrylamide (which has a solubility parameter of 26.6 or more) and many of the claimed cationic monomers and having a molecular weight from 50,000 to 1,000,000 are

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disclosed (Abs; col 1, lines 48-58; col 2, lines 5-9 and 31-52; col 6, line 65 to col 7, line 28).

Linhart et al discloses that, in some embodiments, the non-ionic surfactants are adducts of 1-50 moles of ethylene oxide and/or 1-30 moles of propylene oxide with 1 mole of a fatty alcohol or alkyl phenols. Adducts containing blocks of ethylene oxide and propylene oxide are also disclosed (col 3, lines 34-40 and 50-67; col 4, lines 1-2). The surfactant and cationic polymer can be added to the stock simultaneously and separately from one another or in the form of a mixture (col 7, lines 39-43). Retention aids, such as cationic polyacrylamides which can be prepared from the same monomers as those employed for the cationic fixing agents, but having a molecular weight greater than 2,000,000, can be used in addition to the surfactant and cationic polymer (col 7, line 44 to col 8, line 2).

The art of Connors et al, Fallon, Linhart et al and the instant invention is analogous as pertaining to retention and the use of cationic polymers in papermaking stocks. The copolymers of Connors et al and Linhart et al are disclosed for the same purposes, for controlling stickies and as retention aids in papermaking. The molecular weight and cationic content of the copolymers of Connors et al overlay the required ranges of Linhart et al for both the fixing agent and the retention aid. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the claimed papermaking steps disclosed by Fallon as a typical process and to use the cationic copolymers of Connors et al as the cationic polymer having a charge density of at least 1.5 meq/g and/or as the retention aid in the process of Linhart et al, the

polymers in both references having been disclosed as capable of performing the functions as fixing agent and retention aid. The fact that both polymers were known for the same use in the art presents strong evidence of obviousness in substituting one for the other as a functionally equivalent option. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). It would also have been obvious to one of ordinary skill in the art to obtain the claimed paper quality improving effect from composition so made because a chemical composition and its properties are inseparable. Where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, if a structure substantially identical to that of the claims would have been obvious over the references, the claimed properties or functions would also have been obvious to obtain.

Linhardt et al discloses adding the surfactant and fixing agent simultaneously or as a mixture. Absent convincing evidence of unexpected advantages using a particular order of mixing, it would have been obvious to one of ordinary skill in the art to form a mixture by adding the surfactant to the aqueous dispersion of fixing agent or vice versa as equivalent methods of making the mixture. Alternatively, when the surfactant and copolymer are added to the papermaking furnish separately and simultaneously, at least some of the surfactant is added to a furnish already containing some of the aqueous copolymer.

Regarding Claim 30, Linhart et al does not disclose an anionic monomer. Note that Claim 1 does not require an anionic monomer, thus anionic monomers and the species recited in Claim 30 are optional.

Alternatively, Fallon et al teaches that it is known in the art that acrylamide-containing polymers may contain a minor amount of acrylic acid mer units due to inadvertent hydrolysis of acrylamide mer units even where the polymer is not subjected to conditions that would hydrolyze a substantial portion of the acrylamide (col 5, lines 41-46). Fallon et al discloses cationic polymers comprising a molar amount of acrylamide of less than 50% and that the presence of up to 5 mol-% anionic units (which is about 10% of the total acrylamide units), is considered a minor amount and is not harmful to the polymer's performance as retention aids (col 2, lines 38-46; col 3, line 63 to col 4, line 11; col 5, lines 41-56). From Fallon, one of ordinary skill in the art would expect up to about 10% of the acrylamide units in the cationic polymers of Linhart et al to be hydrolyzed to acrylic acid. It would thus have been obvious to one of ordinary skill in the art at the time of the invention to obtain an amount of acrylic acid monomer units overlaying the claimed range in the cationic copolymers of Linhart et al through inadvertent hydrolysis of the acrylamide mer units.

Claim 6: Connors et al discloses a crosslinkable monomer (col 6, lines 2-5). Also, the acrylamide is a crosslinkable monomer (for evidence, see Xiao et al, col 9, lines 39-42).

Claim 7: The disclosed surfactants significantly overlay the claimed surfactant (B), thus inherently have the claimed HLB values or, at least, it would have been obvious to one of ordinary skill in the art to obtain the claimed HLB values. .

Claims 11 and 19: Connors et al discloses that the copolymers are polymerized in the presence of a carbohydrate [corresponding to water-soluble polymer (C)] such as a polysaccharide, starch, gum, etc., many of which are water soluble (col 3, line 51 to col 4, line 23). The carbohydrate allows for a stable aqueous dispersion with low bulk viscosity (col 17, lines 23-28). While Connors et al does not disclose the molecular weight or viscosity of the carbohydrate, the claimed range for molecular weight includes polysaccharides having from less than 10 to thousands of monomeric units. The broadly claimed values for viscosity range from the viscosity of water to very viscous compositions. Water soluble polysaccharides as disclosed by Connors et al are available in a broad range of molecular weights and have a correspondingly broad range of solution viscosities. It is considered by the Examiner to have been obvious to one of ordinary skill in the art to use a polysaccharide within the claimed ranges as a functionally equivalent option.

Connors et al discloses that the carbohydrates are present in the amount from about 0.01 to 10 wt-% of the dispersion (col 5, lines 3-7). The dispersion has an active copolymers content up to 30% (col 17, lines 27-30). Thus the ratio of copolymer to carbohydrates is 3:1 or greater. The low and high values of the range of surfactant disclosed by Linhart et al are half of the low and high values of the range of the cationic polymer fixing agent. Thus, a ratio of (cationic fixative + surfactant) to carbohydrates of

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4.5 or greater, which significantly overlays the claimed range, would have been obvious to one of ordinary skill in the art.

Claim 13: Making paper at the claimed speed would have been obvious to one of ordinary skill in the art as claimed papermaking speed is typical for most paper types in the art (see Smook, p 324, Table 21-1).

Claim 14: Connors et al and Linhart et al do not disclose a paper made using the polymer and surfactant. However, because the composition is used as an additive in papermaking processes, it would have been obvious to make a paper or pulp sheet from a furnish comprising the composition, thus obtaining a paper or pulp sheet comprising the polymer and surfactant.

Claim 20: Connors et al discloses that the molecular weight of the polymer is from 5,000 to 20,000,000, which significantly overlays the claimed value (col 8, lines 63-65). While the claimed method of measuring the molecular weight is not disclosed, it would have been obvious to one of ordinary skill in the art that the disclosed molecular weight range significantly overlays the claimed range.

Claim 22: Connors et al discloses that the polymer is water soluble (Abs; col 3, lines 19-20). The surfactants of Linhart et al are the same as those claimed, thus it would have been obvious to one of ordinary skill in the art that the polymer and surfactant mixture is water soluble for reasons previously given.

Claim 28 is rejected under 35 U.S.C.103(a) as unpatentable over Connors et al in view of Linhart et al and Fallon, as used in the rejection of Claim 1, and further in view of Keiser et al (6372089).

The disclosures of Connors et al, Linhart et al and Fallon are used as above. Connors et al, Linhart et al and Fallon do not disclose specific locations where the cationic polymers are added. Connors et al does disclose that the cationic polymers can be used with microparticles (col 9, lines 25-27).

Keiser et al discloses a process of making paper comprising adding an organic polymer flocculant, such as a water-soluble cationic polymer, and a colloidal silica microparticle to the papermaking furnish as a microparticle retention system (col 4, line 56 to col 5, line 20; col 7, lines 11-17). Keiser et al teaches that, in microparticle retention programs, the flocculant is added before at least one high shear point, followed by addition of the microparticle just before the headbox. Typically the flocculant will be added before the pressure screens, followed by addition of a microparticle after the screens (col 6, lines 50-56).

The art of Connors et al, Linhart et al, Fallon, Keiser et al and the instant invention is analogous as pertaining to cationic polymeric additives to papermaking processes. It would have been obvious to one of ordinary skill in the art to add the cationic polymer and microparticle to the papermaking furnish prior to the headbox in the process of Connors et al in view of Linhart et al and Fallon and further in view of Keiser et al as a typical process for using microparticle retention systems. It would also

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have been obvious that any additives added prior to the headbox are blended with the pulp material in the headbox.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791